EOSDIS IV&V
Monthly Status Report

For the Period 4/1/96 to 4/30/96

(Deliverable 0203.10)

May 15, 1996

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1. PROGRAMMATIC INFORMATION

1.1 IV&V Project Organization Chart

Exhibit 1-1 illustrates the current organizational structure of the EOSDIS IV&V team. The approximate number of personnel assigned to each technical task is also indicated.

1.2 Overview of Work Being Performed

a) Key Recent Accomplishments

- **Programmatic**

  - Participated in Findings Meeting with ESDIS Management on 4/11/96. Based upon IV&V analysis of current ECS Release A development status, recommended that Hughes be given several months of schedule relief to resolve significant software engineering and testing problems.

  - Attended Release B CDR, generating issues and RIDs as appropriate.

  - Began reorganizing the SI&T task (i.e., Task 11) to better support NASA's needs. This reorganization included dividing the task into four distinct project teams, each focusing on a specific SI&T area.

  - Continued enhancing the Project Issue Tracking System (PITS), including the development of a WWW Browser to access the PITS.

- **Technical**

  - Under Task 4B, delivered ISE Evaluation and Planning TAM. Also, worked on WWW interface for the Project Issue Tracking System (PITS).

  - Under Task 5B, completed both the Release B Requirements Assessment and the Release B Performance Modeling Assessment prior to CDR.

  - Under Task 6B, conducted Release B CDR Design Analysis of Internal interfaces, Data Management Subsystem (DMS), and Data Server Subsystem (DSS). Also, performed Release A test witnessing.

  - Under Task 7, conducted several Summary Level Briefings on ICE findings to NASA Goddard and NASA Headquarters personnel. Delivered enhancements to the CCM Basic System as well as additional underlying file structures.

Exhibit 1-1: Org Chart (Landscape)

- Under Task 9B, reviewed 13 ECS Release B CDR interface documents, including the SDPS/CSMS Internal ICD (DID 313). Prepared TAMs for all of these. Also, evaluated 5 CCRs and prepared Impact Analysis Reports.

- Under Task 10C, completed final report on Component Acceptance Test (CAT) for IR-1. Recommended accepting the system.

- Under Task 11A, completed work on Baseline version of EGS Version 1 I&T Plan. Also, supported ongoing analysis of joint test efforts for TRMM, Landsat 7, and AM-1.

   Additional status information on each of the technical tasks can be found in Appendix A.

b) New/Proposed Task Assignments

- Since IV&V will be the primary user of the EOSDIS Test System (ETS), we believe that it would be in the Government's best interest if NASA directed us to operate and maintain the system after it is fully developed.

1.3   Overview of Schedule Status

Exhibit 1-2 presents the latest, high level milestone chart (i.e., dated May 13, 1996) for all technical tasks assigned on the EOSDIS IV&V contract. In addition, Exhibit 1-3 lists in chronological order the deliverables/milestones associated with the contract for both the current month and the next month, as well as the status of each deliverable/milestone.

1.4   Performance Assurance Activities

- **Performance Assurance Activities**

   - Training on SPR's Checkpoint Cost Estimation Tool was conducted on 4/22 and 4/23 at the Intermetrics Greenbelt office. Members from Intermetrics, NASA Goddard, Hughes, and CSC attended. This training is intended to help EOSDIS project personnel estimate ECS development costs over time as requirements change.

   - Throughout the month of April, IV&V team members have been going to the Goddard Learning Center to receive UNIX and Network training. This training is expected to aid both IV&V System Administrators as well as SI&T Test Team members.

Exhibit 1-2: Milestone Chart (Landscape)

Expected Date Due	Dependency	Milestone/ Deliverable	Task #	Status*	Comments
4/2/96		**CCM File Outputs plus Underlying Subsystems**	**7**	**C**	**Submitted on time.**
4/5/96		**ISE M&O Status Report**	**4B**	**C**	**Submitted on time.**
4/23/96		CCM User Model	7	D	Complete source documentation not available yet. Currently discussing schedule modifications with Dr. Barkstrom.
4/30/96		**Task 6B Monthly Metric Report**	**6B**	**C**	**Submitted on 5/1/96.**
5/1/96		**ISE Evaluation and Planning TAM**	**4B**	**C**	**Submitted ahead of schedule.**
5/1/96		EOSDIS Version 1 Component Acceptance Test Plan for ECS Release A (Preliminary)	10C	CX	Task Canceled.
5/1/96		**EGS Version 1 I&T Plan (Baseline)**	**11A**	**C**	**Submitted on time.**
5/3/96		**ICE Final Written Report**	**7**	**C**	**Submitted on time.**
5/8/96	**Rel B CDR + 2 Weeks**	**Release B CDR Design Analysis TAM(s)**	**6B**	**C**	**Submitted ahead of schedule on 5/2/96.**
5/8/96	**Rel B CDR + 2 Weeks**	**Release B CDR RIDs**	**6B**	**C**	**Submitted ahead of schedule on 5/2/96.**
5/15/96		EOSDIS Version 1 Component Acceptance Test Plan for ECS Release A (Review)	10C	CX	Task canceled.
5/16/96		CCM Hardware Model	7	D	Complete source documentation not available yet. Currently discussing schedule modifications with Dr. Barkstrom.
5/31/96		ISE Element Users Guide - Update	4B	IP	
5/31/96		Task 6B Monthly Metric Report	6B	IP	

* C = Completed, IP = In Process, O = Open, D = Delayed, CX = Canceled
Note: *Italics* indicates tasks that are not yet activated.

EXHIBIT 1-3: Status of Milestones/Deliverables

- IV&V personnel are planning to attend a class on Object Oriented Analysis / Object Oriented Design (OOA/OOD) in May, which will be held at the Hughes facility.

1.5   Major Short Term Activities Planned

- **Program-wide Activities**

    - Continue restructure of Task 11 and reorganization of SI&T Team. Provide NASA with inputs to task SOW to reflect changes.

    - Begin planning IV&V/SI&T support needs for next contract year.

    - Prepare for next Findings Meeting with ESDIS management scheduled for 6/13/96.

    - Monitor issues contained within the PITS system and work to achieve closure on the issues as soon as possible.

    - Activate Mentor/Protégé agreement with GEO Control Systems (GSC) to support the development of an EOSDIS Behavioral Environment for a system under test.

- **Task-specific Activities**

    - For Task 4B, deliver ISE Element Users Guide by 5/31/96. Also, continue developing the PITS WWW Browser, and enhancing ARDB and TMDB tools.

    - For Task 5B, complete Partial Requirements Allocation Assessment TAM and revise Release B End-to-End Modeling Assessment TAM.

    - For Task 6B, continue ECS Release A test witnessing activities. Also, complete Release B CDR design analyses and submit RIDs. Begin planning for Release B Criticality Analysis and Risk Assessment (CARA).

    - For Task 7, deliver Final ICE Written Report and continue ICE Summary Briefings to NASA Management. Also, begin work on CCM User Model.

    - For Task 9, analyze ECS-LaRC DAAC ICD and prepare TAM. Also, review 5 EDOS IRDs and 14 EBNet ICDs.

    - For Task 11, deliver Baseline EGS Version 1 I&T Plan and prepare annotated outline for Confidence Testing program. Also, continue meetings with AM-1, Landsat 7, and TRMM/TSDIS personnel to define joint test objectives.

1.6   Key Long Range Plans/Schedules

The IV&V team will support the activities and milestones identified in Exhibit 1-2. Emphasis will be placed on those activities that are on the critical path to support the on-time launch of the spacecraft. Such activities include supporting System Integration, performing Interface and Integration Testing, and conducting System Certification.

The team will emphasize its System Integration and Test (SI&T) role and narrow its IV&V focus to those activities that support successful SI&T. Other IV&V functions will be secondary and will be prioritized based on available funding.

2. FINANCIAL/CONTRACTUAL INFORMATION

This Section

Has Been Removed

Due to Proprietary Content.

APPENDIX A

TECHNICAL TASK STATUS INFORMATION

Task # 4B: IV&V Infrastructure and Tool Development

a) Task Accomplishments

- Delivered the quarterly ISE Maintenance and Operations Status Report on 4/4/96.

- Completed and delivered the ISE Evaluation and Planning TAM on 4/30/96.

- Continued developing the Project Issue Tracking System (PITS).   Modifications and enhancements include the following:
  - Added the capability to print Review Item Discrepancies (RIDs).
  - Added functionality to support Interface Control Working Group (ICWG) issue tracking needs.
  - Added two issue summary report formats - PITS Issue Summary and ICWG Issue Summary.
  - Initiated development of the PITS WWW Browser. Prototyped ability to query the Sybase PITS repository and to display query results via Netscape.

- Continued modifying/enhancing the Test Management Database (TMDB) and the Automated Requirements Database (ARDB).

- Continued maintenance for the EOSDIS IV&V Homepage and EGS I&T Homepage.

b) Issues/Concerns

- Hughes is planning to upgrade to Version 3 of RTM in late May or early June. IV&V plans to upgrade during the same time frame. In doing so, we must determine whether or not any RTM/Oracle schema changes have been made which might impact ARDB tool usage.

c) Subcontractor Performance

- EWA performance during this reporting period was very good. They supported system administration activities, continued maintenance of the EOSDIS IV&V and EGS I&T Homepage, supported data entry and conversion activities as required to maintain ISE information, and initiated development of the PITS WWW Browser.

d) Planned Activities

- Deliver the ISE Element Users Guide (revision to existing document) by 5/31/96.

- Continue developing the PITS WWW Browser. A release of the initial increment is planned for May.

- Upgrade the Fairmont, WV SPARCserver to Solaris 2.4.

- Upgrade Sybase license from 16 concurrent users to 32 concurrent users.

- Upgrade to Sybase System 11.0.0 from version Sybase System 10.1.0.

- Continue support (refinement, development, and maintenance) for the ARDB, PITS, and TMDB client/server tools.

- Continue maintenance for the EOSDIS IV&V Homepage and EGS I&T Homepage.

- Support program meetings and briefings as required.

Task # 5B: Requirements Analysis and Traceability

a) Task Accomplishments

- Briefed Hughes and ESDIS on End-to-End Modeling Assessment TAM-05-023-03/29/96 prior to CDR. Attended CDR and revised End-to-End Assessment based on CDR materials.

- Supported CDR and submitted requirements-related RIDs in the following areas:
  - Need for M&O.1 requirements baseline.
  - Need for method to identify Release A requirements in requirements baseline for Release   B regression testing.

- As requested by the COTR, delivered unscheduled TAM (TAM-05-027-04/23/96), *SCDO Requirements Traceability and Testability Cumulative Metrics Graphics,* which presented Release A/B requirements metrics reported in TAMs between August 1995 and April 1996 in a graphics chart format, with associated long-term trend analysis.

- Continued to support Hughes, ESDIS QA, and ESDIS I&T with detailed baseline examples to resolve issue of defining RBR allocation to multiple releases (i.e., which part of an RBR goes to which release for testing).

- Completed and delivered TAM-05-025-04/11/96, SCDO Release B Requirements Traceability/Testability.

- Completed and delivered TAM-05-026-04/26/96, SCDO Release B Requirements Criticality Assessment. (For associated metrics in chart format, see Attachment 5-1.)

Completed Release B assessments two months in advance of SOW due date to support Release B CDR. This was possible because of productivity and schedule improvements in the following areas: 1) Improved familiarity of requirements team with ECS, 2) Use of ARDB tool to help organize and record analysis results.

b) Issues/Concerns

- IV&V is concerned that there is a potential mismatch between allocated resources and planned deliverables for the future Task 5 SOW period.

c) Subcontractor Performance

- Subcontractor performance has been very good.

d) Planned Activities

- Complete Partial Requirements Allocation Assessment TAM.

- Revise Release B End-to-End Modeling Assessment TAM.

- Support program meetings and briefings as required.

Task # 6B: ECS Development Analysis

a) Task Accomplishments

- Continued ECS Release A test witnessing. Attended three mini-TRRs and one test demonstration. Reviewed related test documentation and provided comments to ESDIS and HITS.

- Generated SCDO and FOS metrics based on the April 12 release of RTM, the Release B CDR design documentation, the StP repository, and test documentation showing: a) the number of Release A and Release B Level 4 requirements that have no traces to design components specified, b) Release B StP design repository metrics, and c) number of requirements tested/demonstrated. Documented results in Task 6B April Monthly Metrics Report submitted to ESDIS on 5/1/96.

- Attended Release B SCDO CDR.

- Completed design analysis of Data Management Subsystem (DMS) and Data Server Subsystems to support Release B CDR. Findings were documented in TAMs and submitted to ESDIS on 4/22 and 4/29, respectively.

- Began analyzing SDPS/CSMS internal interfaces design in support of the Release B CDR. Submitted comments to ESDIS on 5/2/96.

- Met with ESDIS to define IV&V support for Toolkit 5 Version 1.10 evaluation. Began reviewing Toolkit release documentation.

b) Issues/Concerns

- None.

c) Subcontractor Performance

- Subcontractor performance has been good.

d) Planned Activities

- Continue ECS Release A test witnessing activities.

- Complete Release B CDR design analyses. Submit design analysis TAM on SDPS/CSMS internal interfaces on 5/2/96. (This TAM, along with the DMS and DSS Design Analysis TAMs submitted in April, satisfy IV&V deliverable #0613.)

- Identify Release B CDR issues based on analyses and submit RIDs on 5/2/96.

- Generate updated requirements traceability, design, and test metrics for month of May; document and submit in May Monthly Metrics Report.

- Update IV&V Test Witnessing Plan based on comments from ESDIS.

- Work with Hughes to determine code release schedule to IV&V to support IV&V code analysis using McCabe tool.

- Begin planning activities for Release B CARA to be conducted in late May or early June.

- Support program meetings and briefings as required.

Task # 7: Programmatic and Process Analysis

a) **Task Accomplishments**

- Verified accuracy of final Independent Cost Evaluation (ICE) results with both ICE team members and ESDIS management. Developed ICE Summary Briefing slides and conducted a series of final briefings to top NASA Goddard and Headquarters management personnel.

- Developed ICE Final Written Report to be delivered on 5/3/96.

- Attended Checkpoint training along with members from NASA Goddard, Hughes, and CSC. This training will enable NASA to continue the cost assessment of the ECS Development.

- Delivered enhancements to Community Cost Model (CCM) Basic System on 4/2/96. Delivery included:
  - CCM Prototype with enhanced GUI
  - Initial Entity Databases
  - Limited capability for importing data
  - Document describing the CCM Entity Databases

- Initiated performance analysis/improvement mechanisms for the CCM development effort.

b) **Issues/Concerns**

- The deliverable schedule for the CCM development effort needs to be revisited, since the expected source documentation is not as yet fully available. IV&V has been in contact with Dr. Bruce Barkstrom to try to resolve this issue.

c) **Subcontractor Performance**

- SPR (ECS Assessment), Gartner Group (Hardware Assessment), and Real Decisions (DAAC M&O) performed well during this period, providing all required inputs in a timely manner. In addition, SPR provided a good training seminar on the use of their Checkpoint tool.

d) **Planned Activities**

- Deliver Final ICE Written Report on 5/3/96.

- Continue presenting ICE Summary Briefings to EOSDIS Data Panel and to upper management at NASA Goddard and NASA Headquarters.

- Resolve issues related to CCM delivery schedule.

- Begin work to define User Model, and continue adding functionality to CCM GUI.

- Support other program meetings and briefings as required.

Task # 9B: Key Interface Analysis

a) Task Accomplishments

- Attended ECS CDR detailed design walk-throughs for the Data Server Subsystem and the Ingest Subsystem.

- Reviewed SDPS/CSMS Internal ICD (DID 313), Table 7-1 (External interface mapping to ECS objects).

- Reviewed Ingest Subsystem and Data Server Subsystem Design Specifications and provided inputs for TAM-06-052.

- Provided TBD, TBR, TBS metrics on 11 interface documents to ICWG.

- Reviewed documents and prepared TAMs as follows:

TAM	Deliverable	Title
044	4/1/96	Technical Analysis of the ICD between EDOS and NOAA
045	4/26/96	Technical Analysis of the ICD between ECS and NSI
046	4/23/96	Technical Analysis of the ICD between ECS and SAGE-III
047	5/1/96	Technical Analysis of the ICD between ECS and GSFC DAAC
048	4/30/96	Technical Analysis of the ICD between ECS and ASF DAAC
049	5/3/96	Technical Analysis of the ICD between ECS and ORNL DAAC
050	4/25/96	Technical Analysis of the ICD between ECS and Landsat-7
051	5/1/96	Technical Analysis of the ICD between ECS and SCFs
052	4/30/96	Technical Analysis of the ICD between ECS and NOAA ADCs
053	4/26/96	Technical Analysis of the ICD between ECS and Version 0

TAM	Deliverable	Title
054	5/2/96	Technical Analysis of the ICD between ECS and ASTER GDS
055	4/9/96	Technical Analysis of the EOSDIS - DSN ICD
056	4/9/96	Technical Analysis of the DFCD for the EOS AM-1 PDB

- Evaluated and prepared Impact Analysis Reports for the following CCRs:

CCR	Title
505-01-30-008	EODIS Adaptive Downlink Solutions for the Front End Reshape and EDOS Replan
505-41-13-003	Place Landsat 7 Guide on ECS Document Data Server
505-41-33-002	Move I/V from V0 to WWW & Provide GUI via X11 for reprocessing Requests and for Science S/W and I&T
505-41-13-004	Interface Between Landsat 7 IAS and ECS
505-41-14-005	Deletion of MSFC DAAC

b) Issues/Concerns

- None.

c) Subcontractor Performance

- CTA is the task lead for this effort. Their performance has been very good.

d) Planned Activities

- Review/Analyze the ECS-LaRC DAAC ICD and prepare TAM.

- Review five EDOS IRDs and provide comments to ICWG.

- Review 14 EBNet ICDs and provide comments to ICWG.

- Continue to work with the new PITS ICWG repository and provide feedback on report formats.

- Continue to populate the ICWG PITS repository with work off plan issues from newly received documents.

- Monitor progress on interface issues and update PITS TIMs.

- Support program meetings and briefings as required.

Task # 10C: EOSDIS Independent Component Acceptance Test

a) Task Accomplishments

- Completed and delivered Final IR-1 Component Acceptance Test Summary Report.

- Continued to support SMO ERB (Ellen Herring, chair) to discuss and resolve Discrepancy Reports resulting from Component Test activity.

- Supported IV&V Findings Meeting on 4/11/96 and IR-1 V1.03 Planning Meeting on 4/2 and 4/9.

- Continued to support weekly meetings with ESDIS SMO IV&V Monitor.

b) Issues/Concerns

- None.

c) Subcontractor Performance

- Subcontractor performance has been good.

d) Planned Activities

- None. Task 10 has been canceled by the ESDIS SMO.

Task # 11A: EOS Ground System Integration and Test

a) Task Accomplishments

- Continued Test Version I&T test activity. Retested LaRC to SDPF ingest interface. Due to problems at the SDPF (DDF) this test will need an additional run in May.

- Completed work on the Baseline version of the EGS Version 1 I&T plan with delivery planned for 5/1/96.

- Continued Landsat 7, AM-1 and TRMM technical interchange and MRTT/SITWG meetings.

- Supported ongoing analysis of joint test efforts for TRMM, Landsat 7, and AM-1. Completed initial definition of goals, objectives and responsibilities for ECT tests during this period.

- Planned for future rescope of I&T effort due to cancellation of Task 10.

- Developed presentation and schedule material to support ASTER briefing at GSFC.

- Updated DMR text inputs and schedule materials for use in the revision of the AM-1 DMR by CSC and Dinah Daughtridge.

- Continued to support TICTOC and weekly reviews with Task 11 Manager to ensure task coordination and understanding of related ESDIS and government test critical activities.

b) Issues/Concerns

- We need to rescope Task 11 and revised the SOW due to the cancellation of Task 10.

c) Subcontractor Performance

- Subcontractor performance has been good; however, continued emphasis should be placed on staff planning and time scheduling.

d) Planned Activities

- Prepare annotated outline for Confidence Testing program.

- Continue meetings with AM-1, Landsat 7, and TRMM/TSDIS personnel to define joint test objectives and plans for Version 1 tests.

- Deliver Baseline EGS Version 1 I&T Plan.

- Coordinate EGS support to TRMM EET testing.

- Retest the LaRC to SDPF ingest interface.

- Continue staff technical specialty planning and detailed ECS/EGS system training.

- Begin planning for test witness of EDOS and EBNet tests later this year as early deliveries emerge.

- Re-organize I&T Team to better support the NASA I&T effort.

- Support program briefings as required.

Appendices B and C
have been removed
due to proprietary content.